

STUDY ON THE ACTION EFFICIENCY OF THE MIXES OF HERBICIDES AND FERTILISERS IN THE CORN CROPS

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Abstract

Using mixes of herbicides and fertilizers we obtain synergic effects between the components of those compositions, which is materialized in superior crops compared to the crops obtained when these products are separately used. The mix of fertilizer – herbicide is very efficient on the mono and dicotyledonous weeds of the corn crops. As well, the toxicity of these mixes to mammals is moderate, pertaining to the toxicity group III.

Key words: fertilizer, foliar, herbicide

INTRODUCTION

The efficiency tests of the mix of fertilizer and Icedin Super in the corn crops were carried out by the scientific researchers within the Research Institute of Corn Crops (ICPP) of Bucharest. The experiments were made in conditions of high rate of weeds (the number of weeds reached even 107 plants/m²). On the grounds of the theoretic and technical – economic reasons as well as of preliminary investigations, we studied the possibility to realize compositions of foliar fertilizers and Icedin as concentrated suspensions.

MATERIAL AND METHOD

The Icedin type herbicides have a wide action range, therefore they are used to fight and control more than 200 species of annual and perennial dicotyledonous weeds, including those resistant to the action of the 2.4 D acid (in the mix two herbicides with complementary action are used, which determines a convenient widening of the action range). The Icedin products are applied post-emergent, during the vegetation when the air temperature is of minimum 7°C, tending to be higher. Liquid

compositions of foliar fertilizers and Icedin are used as concentrated suspensions.

The suspension is made by inserting the Icedin, the emulsifier and the dispersing agent into the fertilizer solution, by agitation, at 30-75°C.

The obtained concentrated suspensions have been analyzed from the point of view of the stability of the active products (herbicides) they are made of. After 30 – 45 days from the making the diminution of the active products' (2.4 D acid and Dicamba) concentrations was no longer found.

As a conclusion, we may obtain concentrated suspensions of liquid fertilizers and Icedin type fertilizers with appropriate physical – chemical stability in time.

The solid mixes (as granules) made up of chemical fertilizers and Icedin type herbicides were made by depositing the herbicides in solution on the fertilizers granules and eliminating humidity by means of a warm air current.

On the grounds of the theoretical and technical – economic reasons as well as of preliminary investigations, we reached the conclusion that liquid compositions of foliar fertilizers and Icedin may be obtained as concentrated suspensions.

RESULTS AND DISCUSSIONS

The observations were made 30 and 60 days after the treatment.

The results of the tests of the herbicide efficiency of the mix of fertilizer and Icedin Super in fighting and controlling the weeds of the corn crops are presented in table 1.

As standard herbicide we used Icedin Super.

The toxicity to mammals of the ICEDIN products is moderate, the average lethal doses (DL₅₀) being of 305-320 mg/kg of live weight. These herbicides pertain to the toxicity group III. DL₅₀ for mammals of 2.4-D is of 350-360 mg/kg, the amine salt of 2.4 D has DL₅₀=980-1200 mg/kg (low toxicity). For mammals, Dicamba has DL₅₀=1200-1300 mg/kg (low toxicity).

Table 1. The results of the herbicide action efficiency of the mix of fertilizer and Icedin Super in the corn crops

Product	30 days after the treatment						60 days after the treatment					
	Dicot.		Monocot.		Total		Dicot.		Monocot.		Total	
	Dens.	E (%)	Dens.	E (%)	Dens.	E (%)	Dens.	E (%)	Dens.	E (%)	Dens.	E (%)
Untreated sample	2.5	-	1.5	-	4	-	0.5	-	1	-	1.5	-
Un-weeded sample	17.5	-	80	-	97.5	-	21.5	-	88.5	-	107	-
Fertilizer +Icedin Super 4l/ha	0	100	27.2	66	27.2	72.2	5.5	74.5	22	74.3	27.5	74.3
Icedin Super 1l/ha	3.5	80	25	68.8	28.5	70.8	2.5	88.4	26	69.6	28.5	73.4

Dens.= density compared to un-weeded Mt.

Weeds present in the corn crop when the treatment was made:

Annual dicotyledonous

Amaranthus retroflexus
Chenopodium album
Galisonga parviflora
Polygonum Spp
Portulaca oleracea
Solanum nigrum
Sonchus oleraceus

Perennial dicotyledonous

Cirsium arvense
Convolvulus arvensis

Annual monocotyledonous

Setaria spp.
Echinochloa crusgalli

CONCLUSIONS

After the tests made within I.C.P.P. Bucharest, the following conclusions were drawn:

a) the efficiency of the herbicide action of the mix of fertilizer and Icedin Super was similar to the one of the product used as standard (Icedin Super); both the mix of fertilizer – herbicide as well as Icedin Super are highly efficient on the dicotyledonous and monocotyledonous weeds;
b) the assessment of the results of the herbicide efficiency of the mix of fertilizer with herbicide must take into consideration two important issues:

-b.1.) the experiments were made in a period when certain weeds were in more advanced vegetative states, when they are more resistant to the herbicide action of Icedin;

-b.2.) the testing was carried out in conditions of extremely high weed rate (107 plants/m²);

c) the conditions of the experiments (non irrigation) did not allow definite assertions

related to the effects of the fertilizers on the yield increase.

d) Icedin products have moderate toxicity in mammals.

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